

OCCURRENCE OF VOLATILE ORGANICS IN DRINKING  
WATER.

WATER

--BRIEFING--

THE OCCURRENCE OF VOLATILE ORGANICS  
IN DRINKING WATER

FOR  
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FOR DRINKING WATER  
MARCH 6, 1980

PREPARED BY  
CRITERIA AND STANDARDS DIVISION  
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EXPOSURE ASSESSMENT PROJECT

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## TABLE OF CONTENTS

	PAGE
PURPOSE	1
PARAMETERS OF ANALYSIS	2
DATA AVAILABILITY	3
RANKING OF ORGANICS BY FREQUENCY	4
POPULATION CHARACTERISTICS OF FEDERAL SAMPLING - SURFACE WATER	6
STATISTICS ON RAW AND FINISHED SURFACE WATER	7
POPULATION CHARACTERISTICS OF FEDERAL SAMPLING - GROUND WATER	9
STATISTICS ON RAW AND FINISHED GROUND WATER	10
COMPARATIVE DATA ON GROUND AND SURFACE WATER	-
TRICHLOROETHYLENE	12
CARBON TETRACHLORIDE	13
TETRACHLOROETHYLENE	14
1,2-DICHLOROETHANE	15
1,1,1-TRICHLOROETHANE	16
1,1-DICHLOROETHANE	17
TRANS-DICHLOROETHYLENE	18
CIS-DICHLOROETHYLENE	19
1,1-DICHLOROETHYLENE	20
METHYLENE CHLORIDE	21
VINYL CHLORIDE	22
HOT SPOT IDENTIFICATION BY STATES	24
SUMMARY OF STATE DATA ON VOLATILES	25
SUMMARY OF STATE DATA FOR SPECIFIC CHEMICALS	-
TRICHLOROETHYLENE	26
CARBON TETRACHLORIDE	27
TETRACHLOROETHYLENE	28
1,2-DICHLOROETHANE	29
1,1,1-TRICHLOROETHANE	30
1,1-DICHLOROETHANE	31
DICHLOROETHYLENE	32
METHYLENE CHLORIDE	33
VINYL CHLORIDE	34
DETAILED DATA FROM NEW JERSEY	36
ORGANICS FOUND IN NEW YORK	37
ORGANICS - NASSAU COUNTY, NEW YORK	38
FUTURE SOURCES OF DATA	40

	PAGE
POPULATION CHARACTERISTICS OF RURAL SURVEY - GROUND WATER	41
REGIONAL DISTRIBUTION OF RURAL SURVEY - GROUND WATER	42
POPULATION CHARACTERISTICS OF COMMUNITY SURVEY - GROUND WATER	43
POPULATION CHARACTERISTICS OF COMBINED FEDERAL DATA	44
STATE PLANS FOR 1980	45
TOTAL DATA ON VOLATILES IN WELLS	46
FINDINGS	47
RECOMMENDATIONS	48

THE OCCURRENCE OF VOLATILE ORGANICS  
IN DRINKING WATER

PURPOSE

1. TO DEFINE THE EXISTING DATA ON VOCs IN DRINKING WATER, WITH EMPHASIS ON GROUND WATER.
2. TO DETERMINE IF THE FREQUENCY AND CONCENTRATION OF SPECIFIC VOCs DEMONSTRATE A NEED FOR MCL REGULATION AND IF SO IF THERE IS ENOUGH DATA TO SUPPORT A REGULATION.

## PARAMETERS OF ANALYSIS

- ° FREQUENCY OF OCCURRENCE
  - NUMBER OF SAMPLES VS. NUMBER POSITIVE
  
- ° LEVELS FOUND (CONCENTRATIONS).
  
- ° REPRESENTATIVENESS OF SAMPLES
  - POPULATION COVERAGE
  - SIZE OF SYSTEM
  - REGIONAL DIFFERENCES

## DATA AVAILABILITY

### FEDERAL

NORS

NOMS

SRI

OTS\*

ANNAPOLIS FIELD STUDY\*

REGION V SURVEY\*

### STATE DATA

-DATA AVAILABLE FROM APPROXIMATELY 19-20 STATES

-DATA ONLY AVAILABLE (IN MOST CASES) IN SUMMARY FORM

\*LIMITED SURVEYS

A RANKING OF ORGANIC CHEMICALS BY THE  
FREQUENCY OF REPORTED PRESENCE IN FINISHED  
SURFACE WATER (SRI, NOMS, NORS)

<u>SURFACE</u>	<u>FREQUENCY %</u>	<u>GROUND</u>	<u>FREQUENCY %</u>
CHLOROFORM	99.6	CHLOROFORM	70.3
BROMODICHLOROMETHANE	95.0	BROMODICHLOROMETHANE	69.2
CHLORODIBROMOMETHANE	79.3	CHLORODIBROMOMETHANE	64.5
PENTACHLOROPHENOL	38.1	BROMOFORM	36.3
DIETHYL PHTHALATE	36.1	DICHLORODIOMETHANE	30.3
DICHLORODIOMETHANE	35.2	DIBUTYL PHTHALATE	28.6
DIBUTYL PHTHALATE	33.3	*TETRACHLOROETHYLENE	26.1
ATRAZINE	27.8	*1,1,1-TRICHLOROETHANE	22.2
2,4-DICHLOROPHENOL	21.8	*1,1-DICHLOROETHANE	21.4
BENZENE	21.6	*CIS-1,2-DICHLOROETHYLENE	21.4
PHTHALIC ACID	20.4	PHTHALIC ACID	21.4
TOLUENE	19.4	2,4-DICHLOROPHENOL	17.2
*TETRACHLOROETHYLENE	17.8	*TRICHLOROETHYLENE	16.4
*CARBON TETRACHLORIDE	16.0	DIETHYL PHTHALATE	14.3
*TRICHLOROETHYLENE	15.5	P-DICHLOROBENZENE	12.9
SIMAZINE	13.0	BIS(2-CHLOROETHYL)ETHER	8.7
P-DICHLOROBENZENE	12.5	BENZENE	8.5
BROMOFORM	12.4	ETHYL CHLORIDE	7.1
1,3,4-TRICHLOROBENZENE	11.5	TRICHLOROFLUOROMETHANE	7.1
DICHLOROMETHANE	10.0	*1,1-DICHLOROETHYLENE	7.1
*1,1,1-TRICHLOROETHANE	9.9	*TRANS-1,2-DICHLOROETHYLENE	7.1
DISULFOTON	9.2	CHLOROBENZENE	7.1
BENEFIN	9.2	SIMAZINE	7.1
MALATHION	6.5	METHYL PARATHION	7.1
FLUORANTHENE	5.8	MALATHION	7.1
PHENYL ACETIC ACID	4.6	PENTACHLOROPHENOL	6.9
CYANAZINE	4.6	FLUORANTHENE	6.9
PROPAZINE	4.6	DICHLOROMETHANE	6.7
*CIS-1,2-DICHLOROETHYLENE	4.6	*CARBON TETRACHLORIDE	5.5
TRICHLOROFLUOROMETHANE	4.6	BIS(2-CHLOROSOPROPYL)ETHER	4.3

\*PRESENTLY BEING CONSIDERED FOR MCLs.



ORGANIC VOLATILES  
IN  
SURFACE WATER SUPPLIES

FEDERAL DATA

POPULATION CHARACTERISTICS OF  
 SURFACE WATER SYSTEMS SAMPLED  
 (SRI, NOMS, OTS, REGION V)

<u>POPULATION SERVED</u>	<u># OF SYSTEMS IN U.S.</u>	<u># OF SYSTEMS WHICH HAVE DATA</u>	<u>%</u>
25- 99	814	0	0
100- 499	919	1	.1
500- 999	1,014	1	.1
1,000- 2,499	864	1	.1
2,500- 4,999	798	9	1.1
5,000- 9,999	519	9	1.7
10,000-99,999	771	62	8.0
100,000-1 MILLION	135	90	66.7
OVER 1 MILLION	10	8	80.0
TOTALS	5,844	181	3.1

COMPARATIVE STATISTICS ON THE CONCENTRATION  
OF SELECTED ORGANICS IN RAW AND  
FINISHED WATER (SURFACE) MG/L

	# CITIES SAMPLED		% POSITIVE SAMPLES		MEAN		MEDIAN		RANGE	
	RAW	FIN	RAW	FIN	RAW	FIN	RAW	FIN	RAW	FIN
TRICHLOROETHYLENE	105	133	11.4%	32.3%	.9	.47	.25	.26	.1-42	.06-3.2
CARBON TETRACHLORIDE	154	181	9.7%	44.8%	2.98	3.58	2.0	1.0	.2-10.0	.1-30
TETRACHLOROETHYLENE	154	180	13.6%	24.4%	1.96	1.49	2.0	.3	.1-9.0	.1-21
1,2-DICHLOROETHANE	105	133	9.5%	4.5%	1.46	2.14	.55	1.8	.1-45	.8-4.8
1,1,1-TRICHLOROETHANE	105	133	12.4%	21.8%	.32	.56	.2	.4	.1-1.2	.1-3.3
1,1-DICHLOROETHANE	105	103	1.9%	2.9%	.1	.2	.1	.2	.1-.1	.2-.2
TRANS-DICHLOROETHYLENE	105	103	1.0%	0	.1	.0	-	0	.1-.1	0
CIS-DICHLOROETHYLENE	105	103	2.9%	4.9%	.17	.66	.2	.3	.1-.2	.1-2.2
1,1-DICHLOROETHYLENE	105	103	0	1.9%	0	.36	0	.36	0	.2-.51
METHYLENE CHLORIDE	154	178	3.2%	18.0%	4.44	1.81	1.0	1.15	.4-19.0	.2-13
VINYL CHLORIDE	105	133	7.6%	2.3%	2.85	3.43	3.25	.4	.2-5.1	.1-9.8

ORGANIC VOLATILES  
IN  
GROUND WATER SUPPLIES

BASED ON FEDERAL DATA

POPULATION CHARACTERISTICS OF  
GROUNDWATERS SAMPLED\*

<u>POPULATION SERVED</u>	<u># SYSTEMS IN U.S.</u>	<u># SYSTEMS WHICH HAVE DATA</u>	<u>%</u>
25- 99	19,205	0	0
100- 499	13,361	0	0
500- 999	4,168	0	0
1,000- 2,499	4,339	1	0.02
2,500- 4,999	1,619	2	0.1
5,000- 9,999	1,355	1	0.07
10,000- 99,999	1,196	15	1.3
100,000-1 MILLION	66	20	30.3
OVER 1 MILLION	1	0	0
TOTALS	45,310	39	0.09

\*BASED ON SRI, NOMS AND REGION V STUDY.

COMPARATIVE STATISTICS ON THE  
CONCENTRATION OF SELECTED ORGANICS  
IN RAW AND FINISHED WATER (GROUND) µG/L

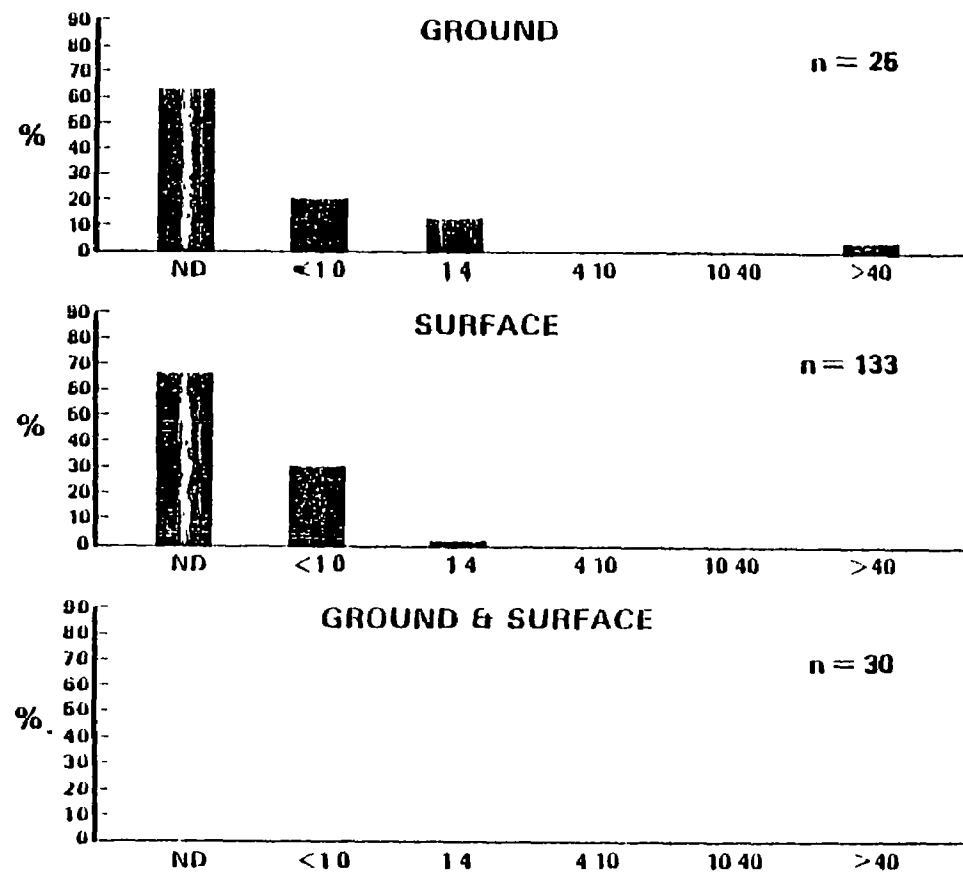
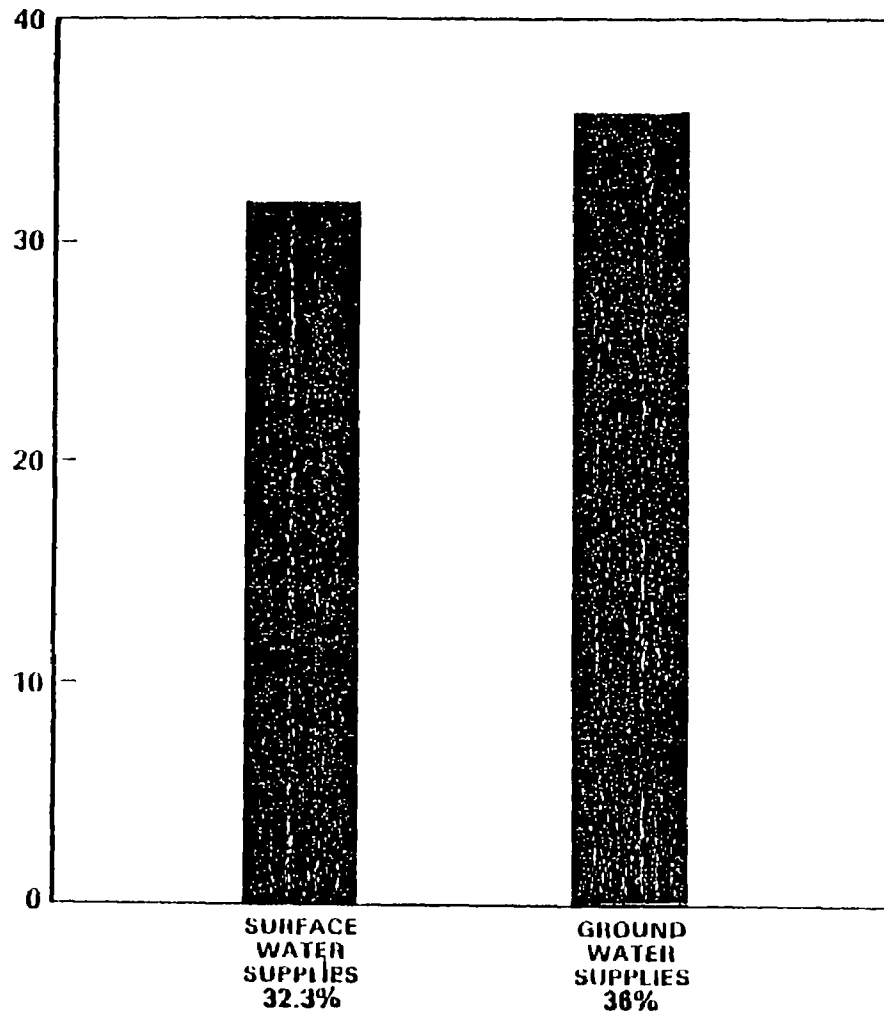
	# CITIES SAMPLED		% POSITIVE SAMPLES		MEAN		MEDIAN		RANGE	
	RAW	FIN	RAW	FIN	RAW	FIN	RAW	FIN	RAW	FIN
TRICHLOROETHYLENE	13	25	38.5	36.0	29.72	6.76	1.3	.31	.2-125.0	.11-53.0
CARBON TETRACHLORIDE	27	39	7.4	28.2	11.5	3.8	11.5	2.0	3.0-20.0	.2-13.0
TETRACHLOROETHYLENE	27	36	18.5	22.0	.98	2.08	.6	3.0	.1-2.0	.2-3.1
1,2-DICHLOROETHANE	13	25	7.7	4.0	.2	.2	-	-	.2	.2
1,1,1-TRICHLOROETHANE	13	23	23.1	21.7	4.8	2.13	1.1	2.1	.3-15.0	1.3-3.0
1,1-DICHLOROETHANE	13	13	23.1	23.1	.7	.3	.8	.2	.4-.9	.2-.5
TRANS-DICHLOROETHYLENE	13	13	15.4	15.4	1.75	1.05	1.75	1.05	.2-5.3	.2-1.9
CIS-DICHLOROETHYLENE	13	13	38.5	30.8	13.56	9.35	.1	.15	.1-69.0	.1-37.0
1,1-DICHLOROETHYLENE	13	13	15.4	7.7	.5	.2	.5	-	.5-.5	.2
METHYLENE CHLORIDE	27	38	3.7	2.6	4.0	7.0	-	-	4.0	7.0
VINYL CHLORIDE	13	25	15.4	4.0	5.8	9.4	5.8	-	2.2-9.4	9.4

COMPARISON OF THE LEVELS  
OF  
VOLATILE ORGANICS  
IN  
GROUND AND SURFACE WATER SUPPLIES

BASED ON FEDERAL DATA

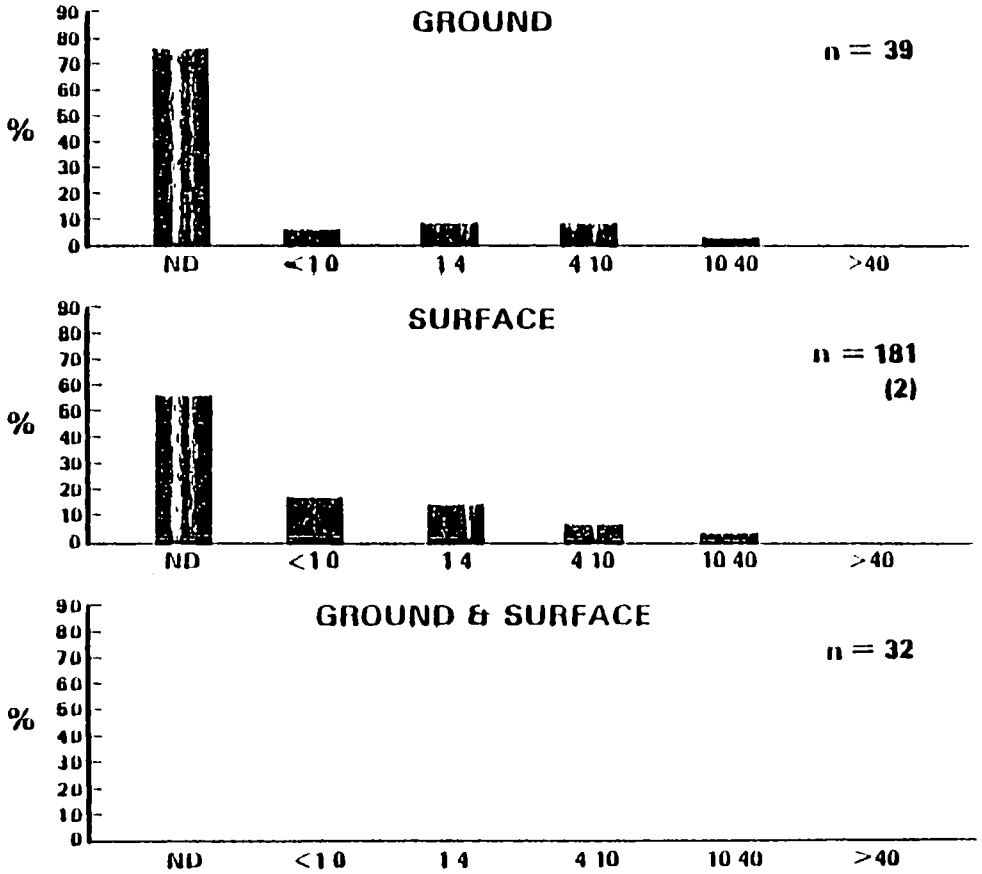
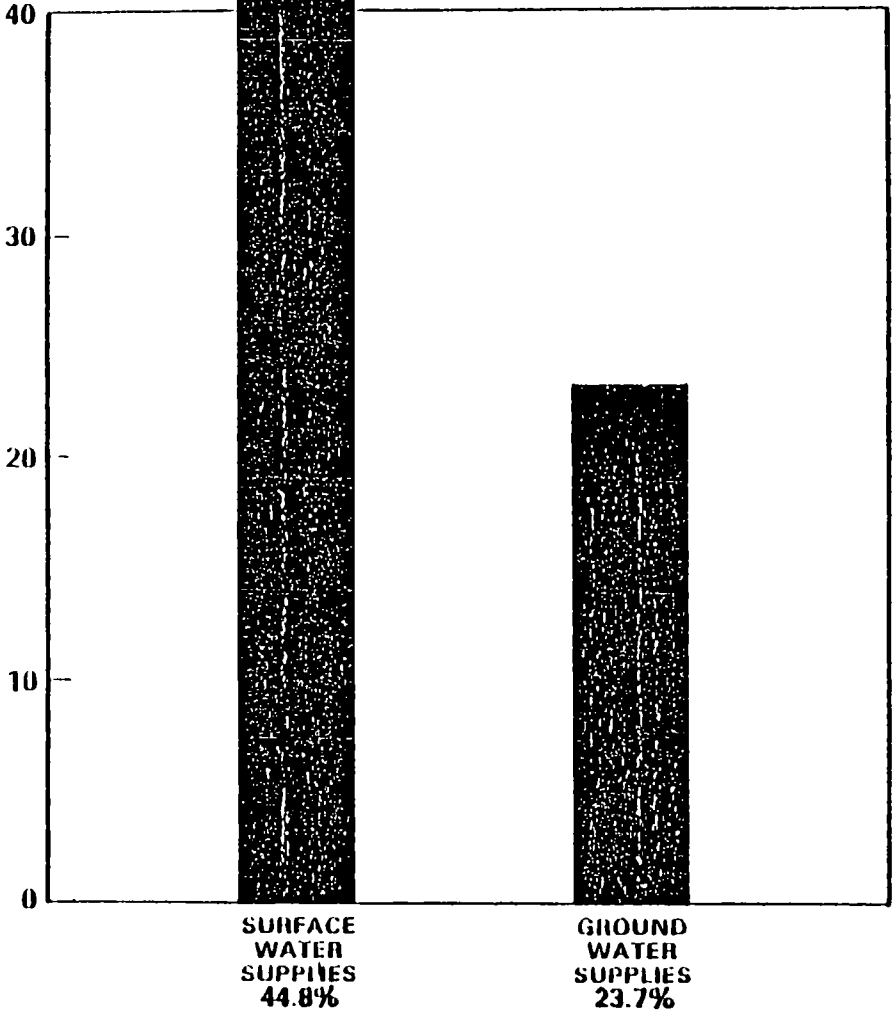
# TRICHLOROETHYLENE

$Cl_2C=CHCl$

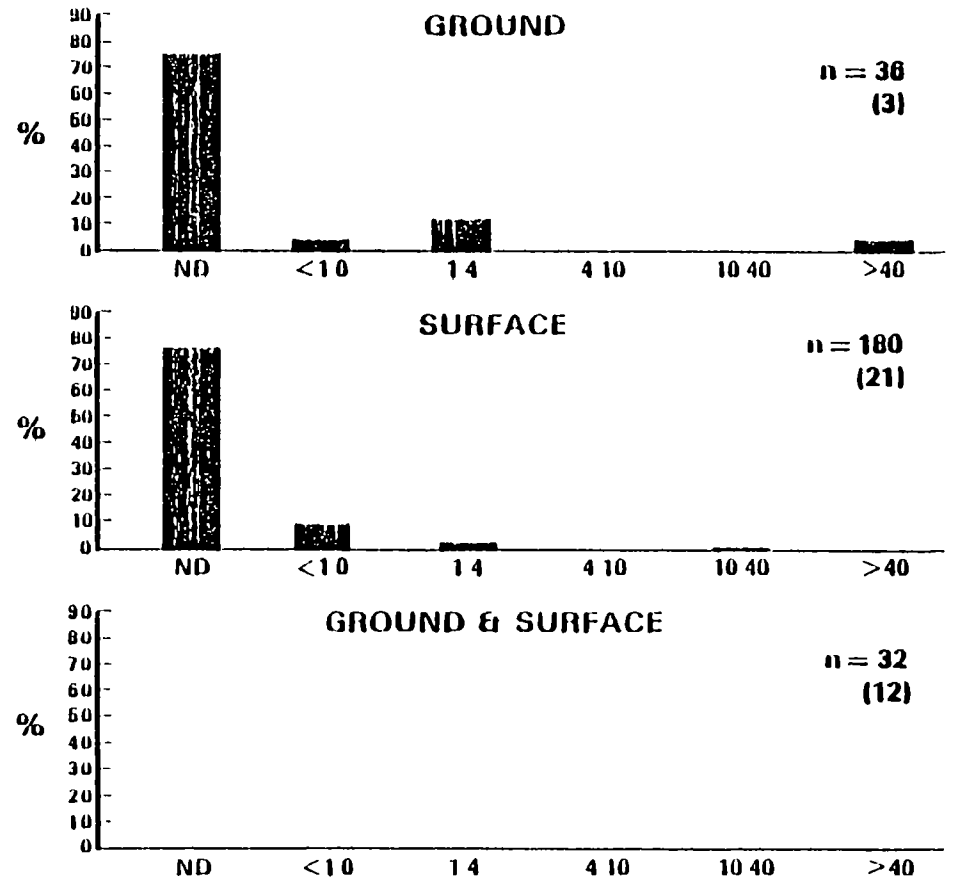
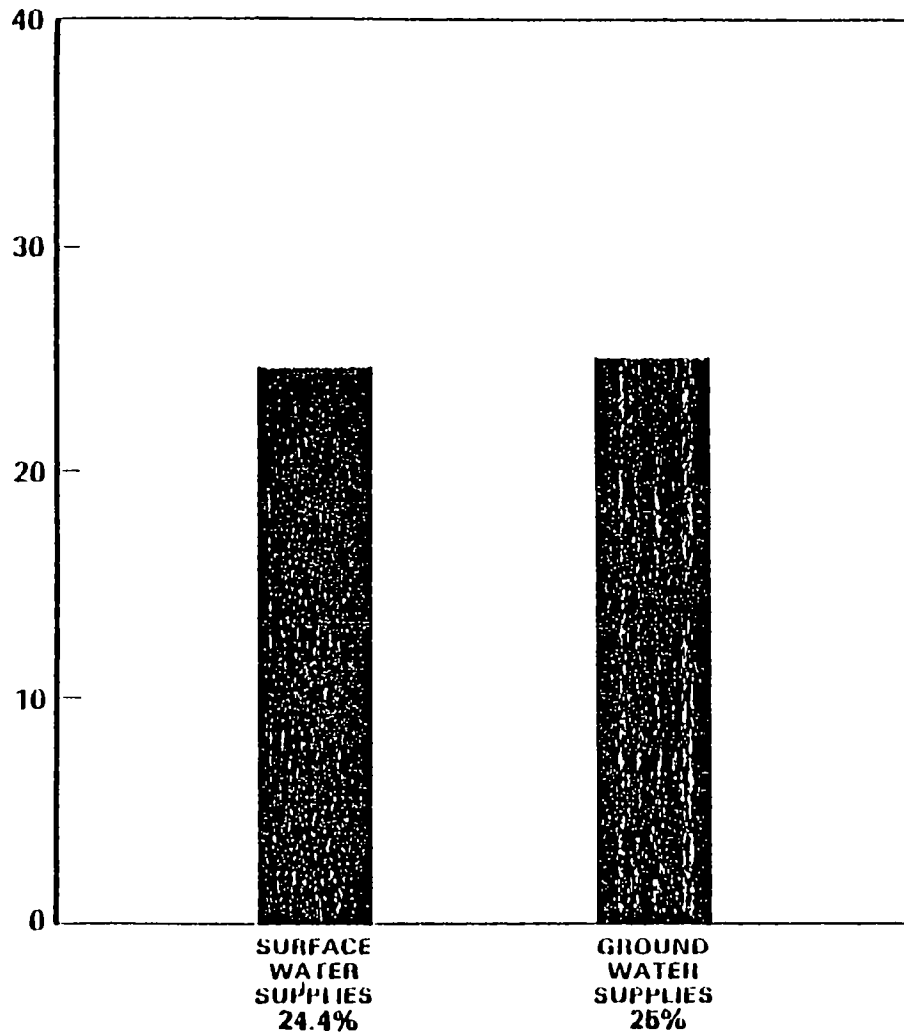




# CARBON TETRACHLORIDE CCl<sub>4</sub>

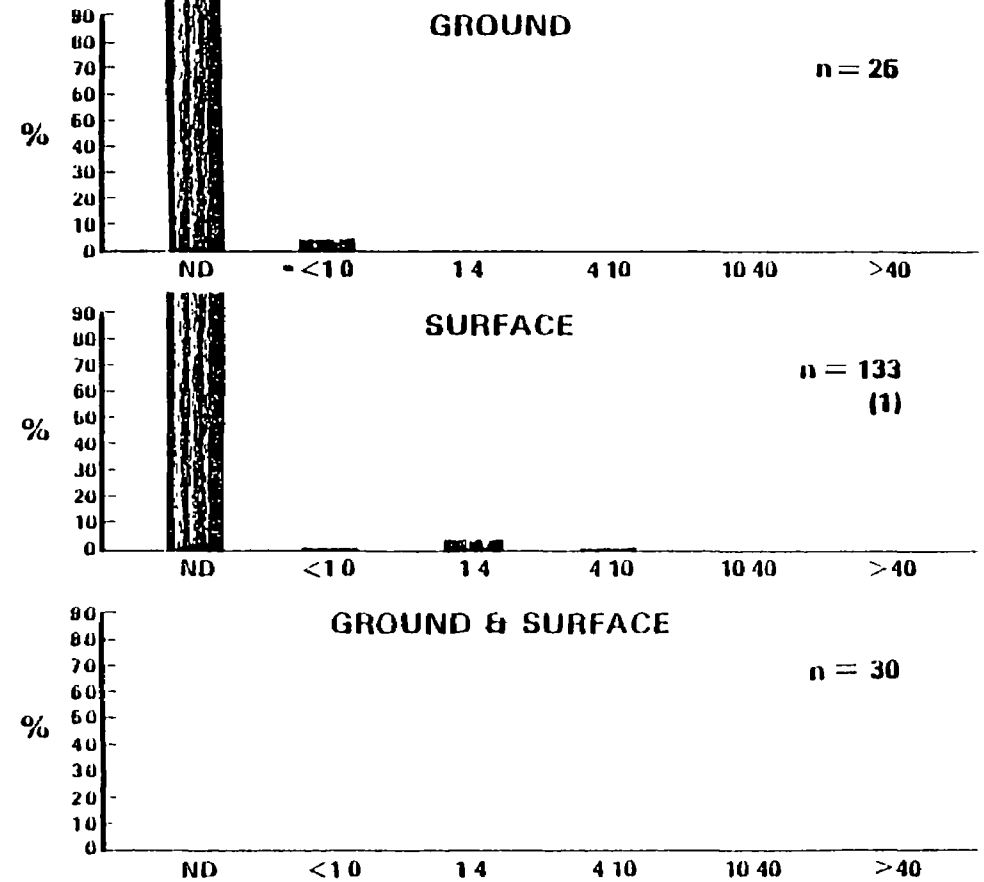
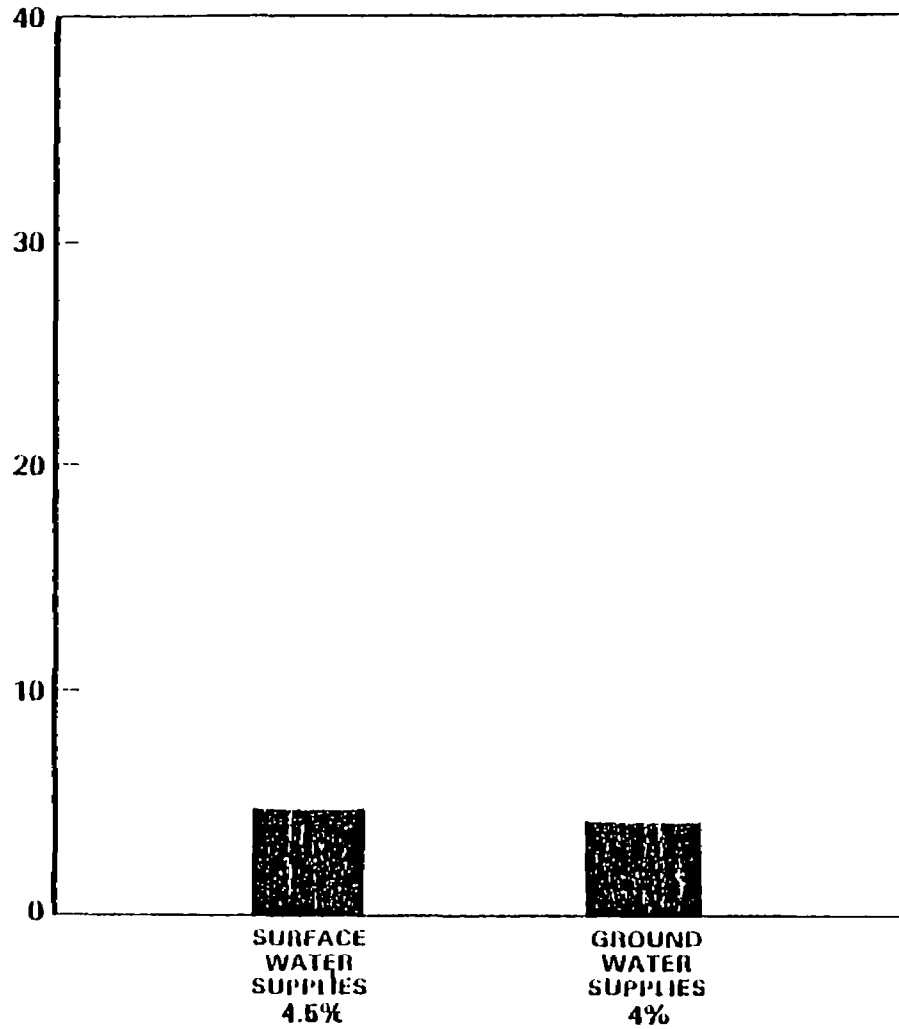


# TETRACHLOROETHYLENE



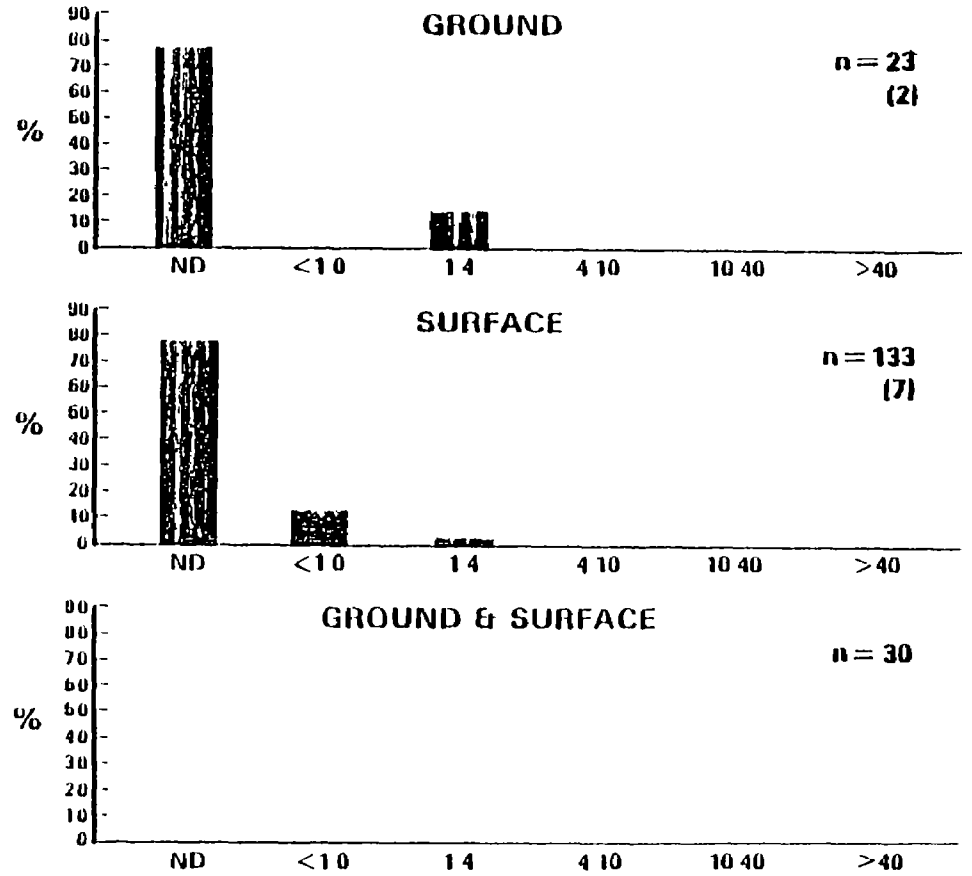
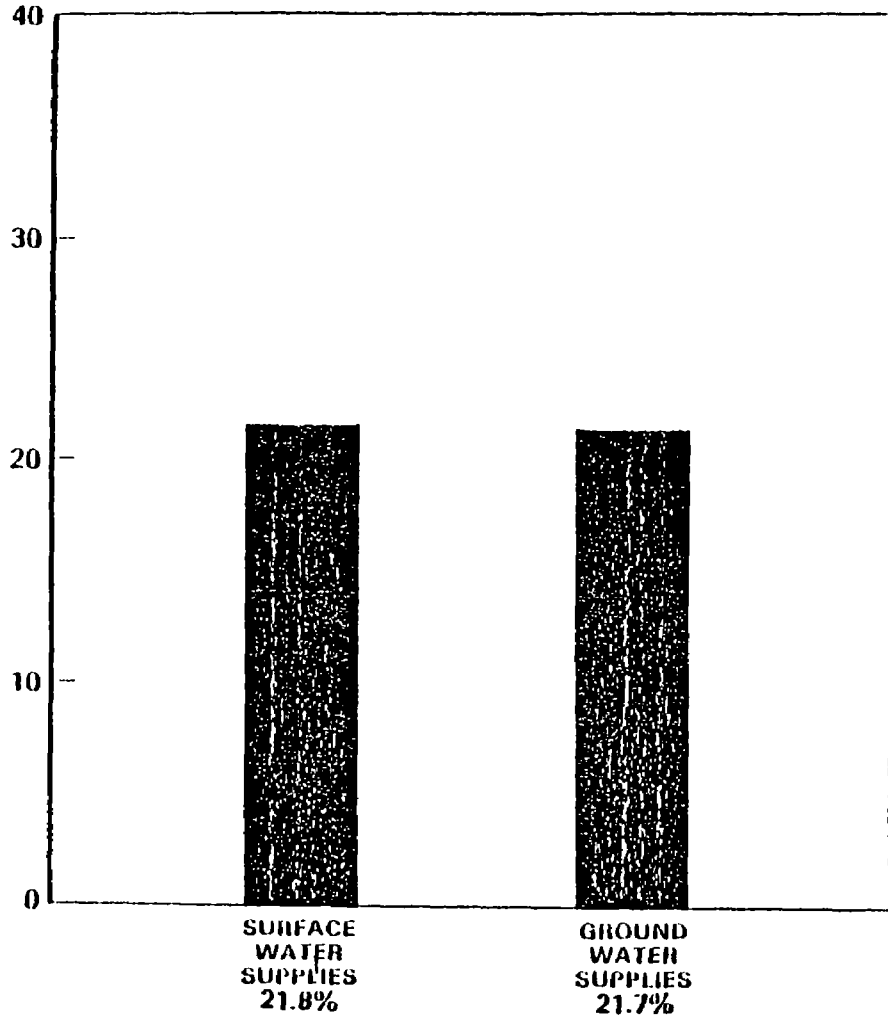
# 1, 2-DICHLOROETHANE

CH<sub>2</sub>ClCH<sub>2</sub>Cl

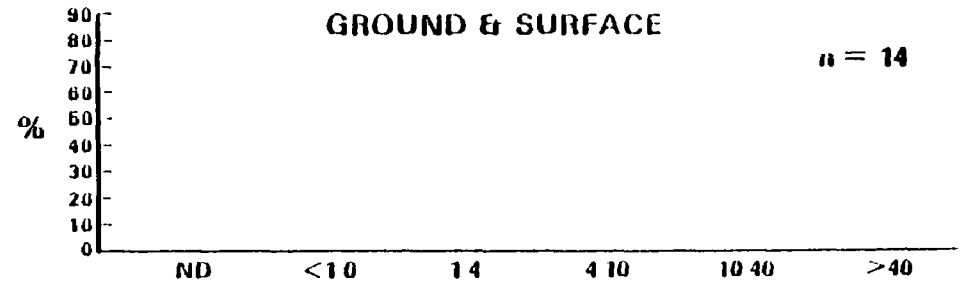
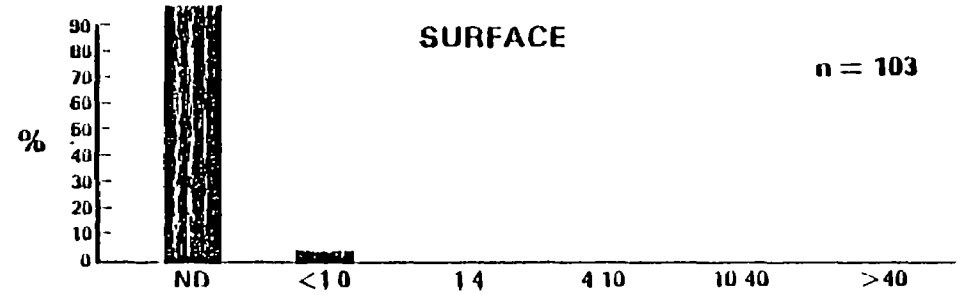
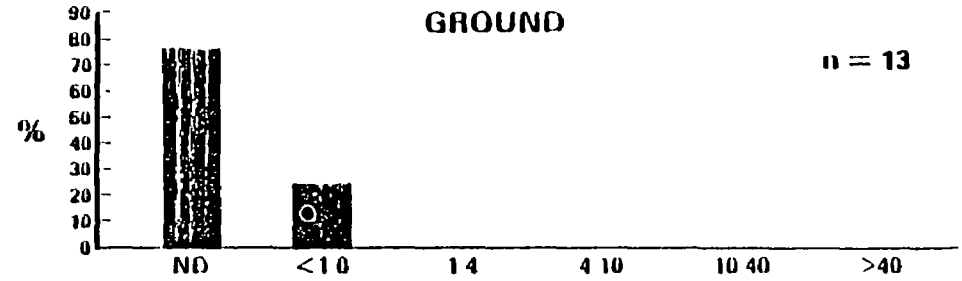
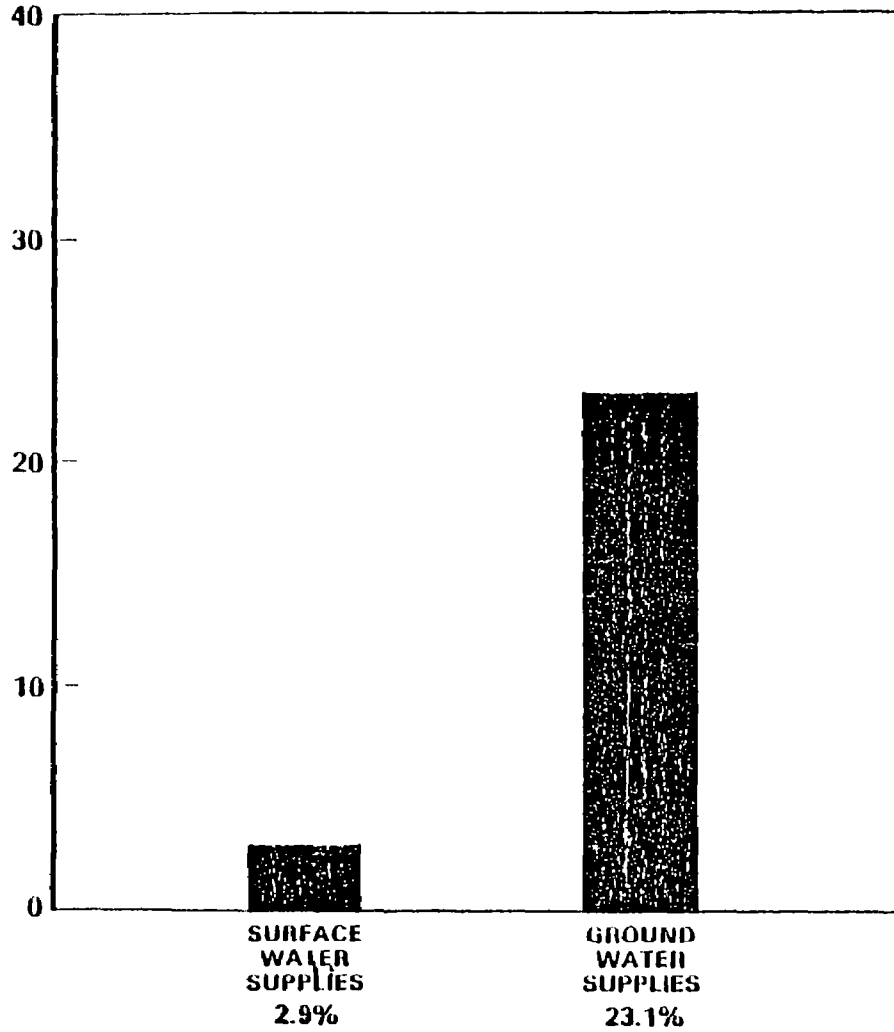
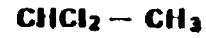


# 1, 1, 1-TRICHLOROETHANE

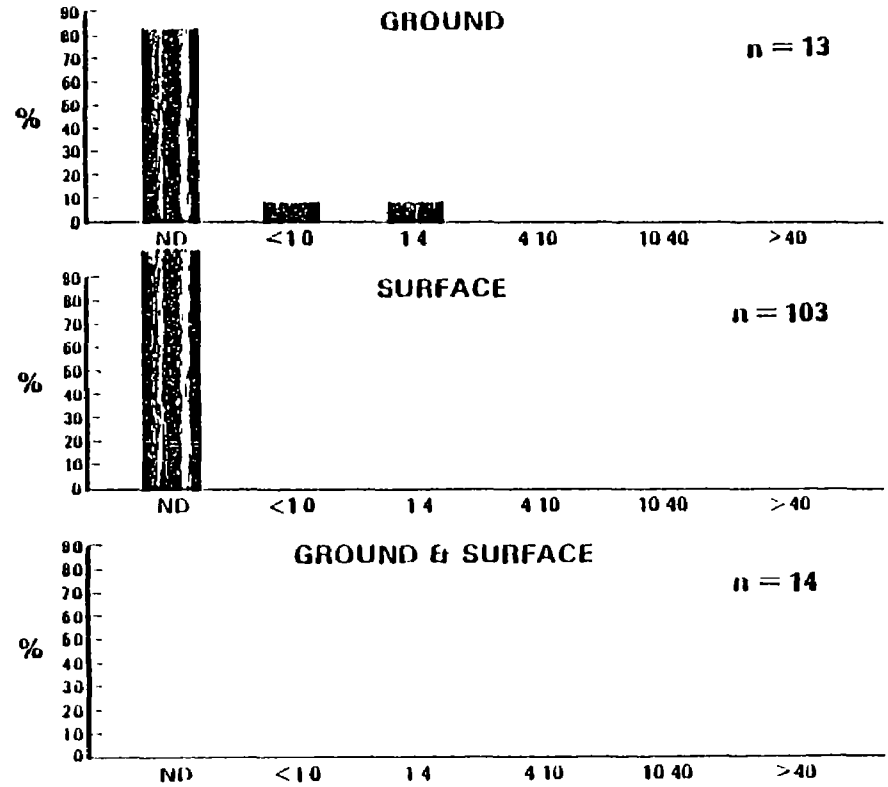
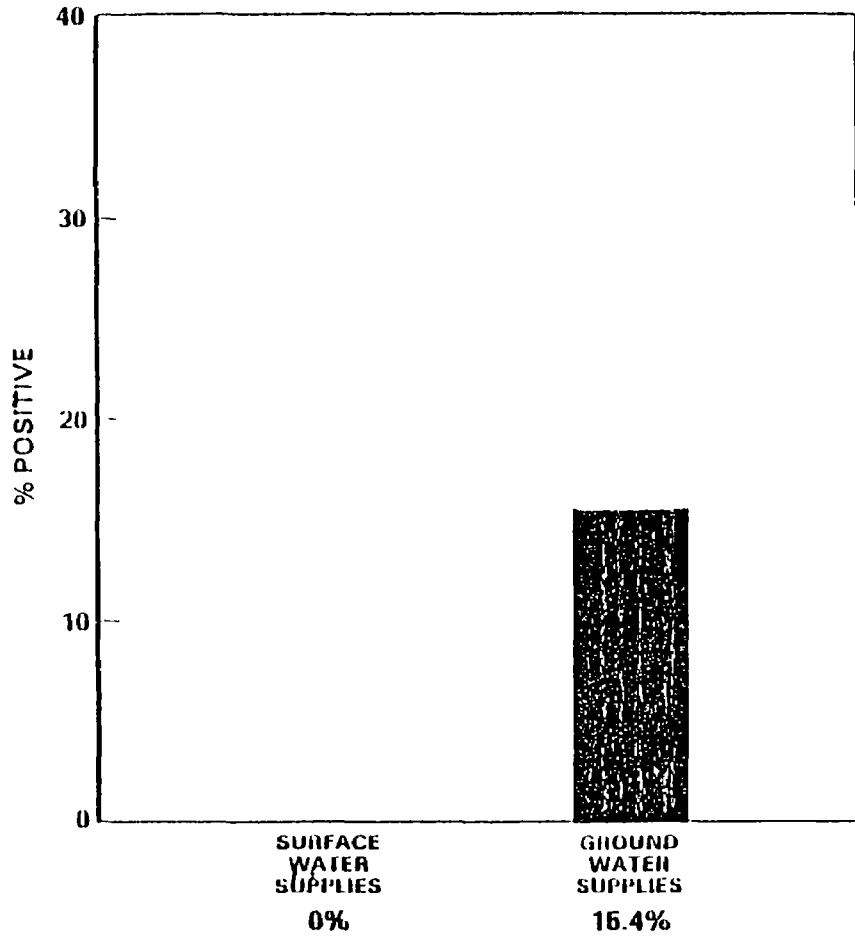
$\text{Cl}_3\text{C} - \text{CH}_3$



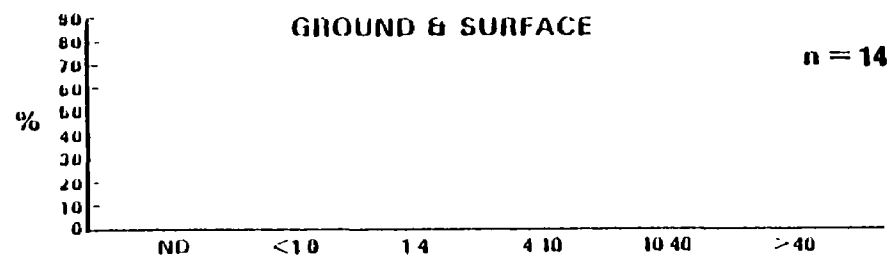
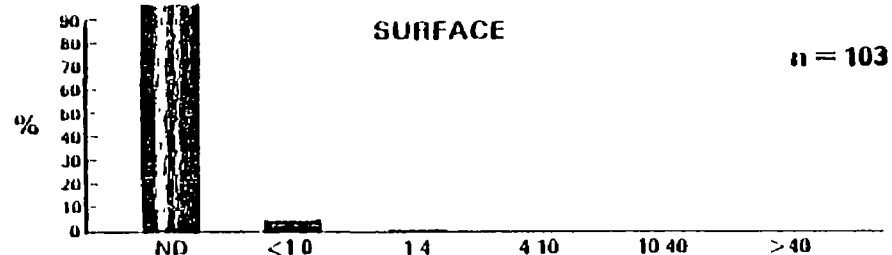
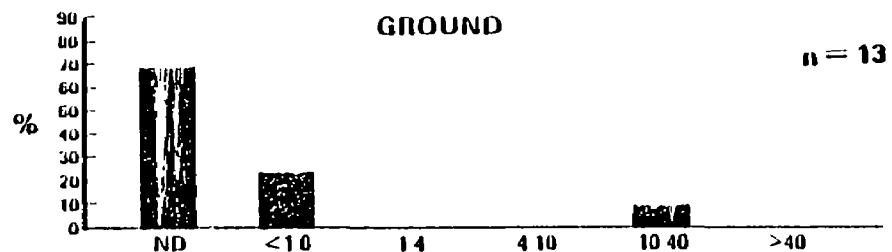
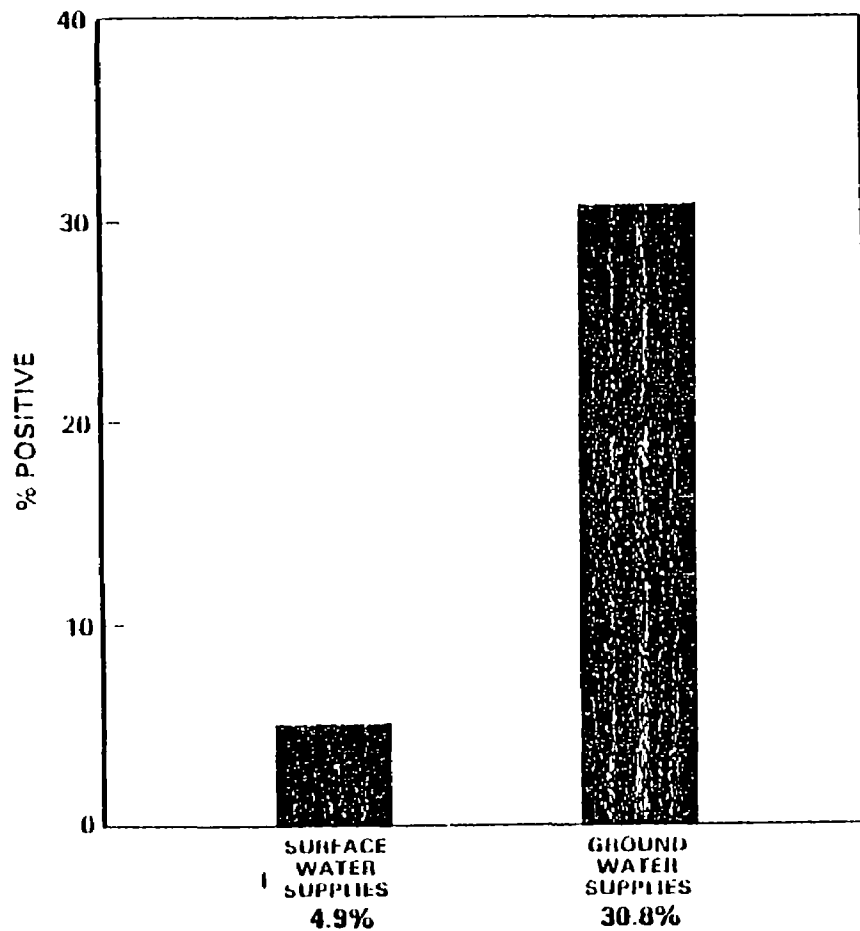
# 1, 1-DICHLOROETHANE



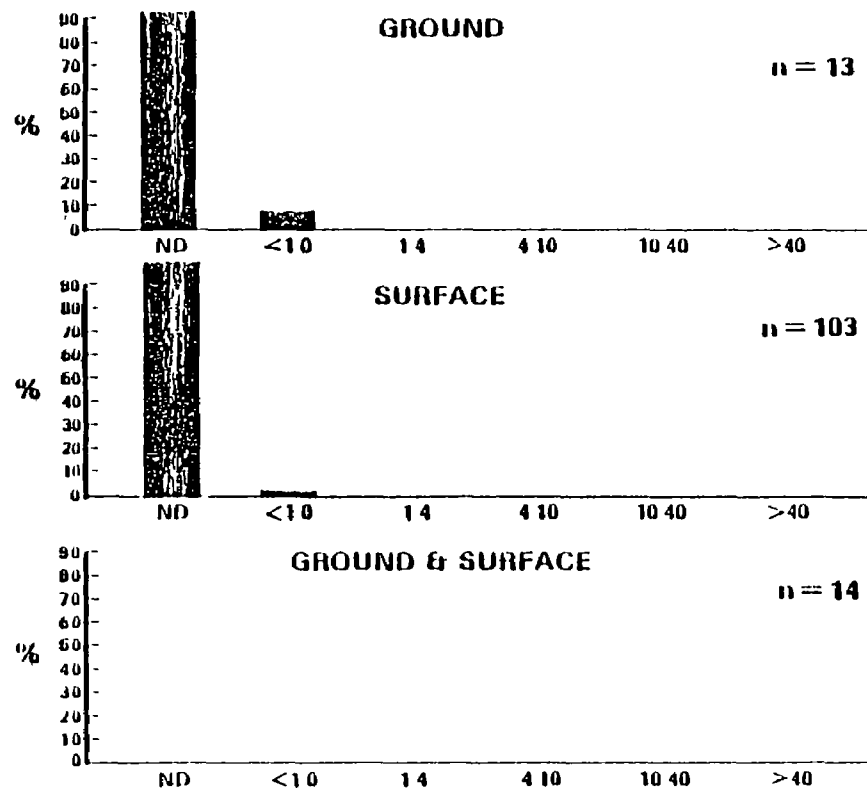
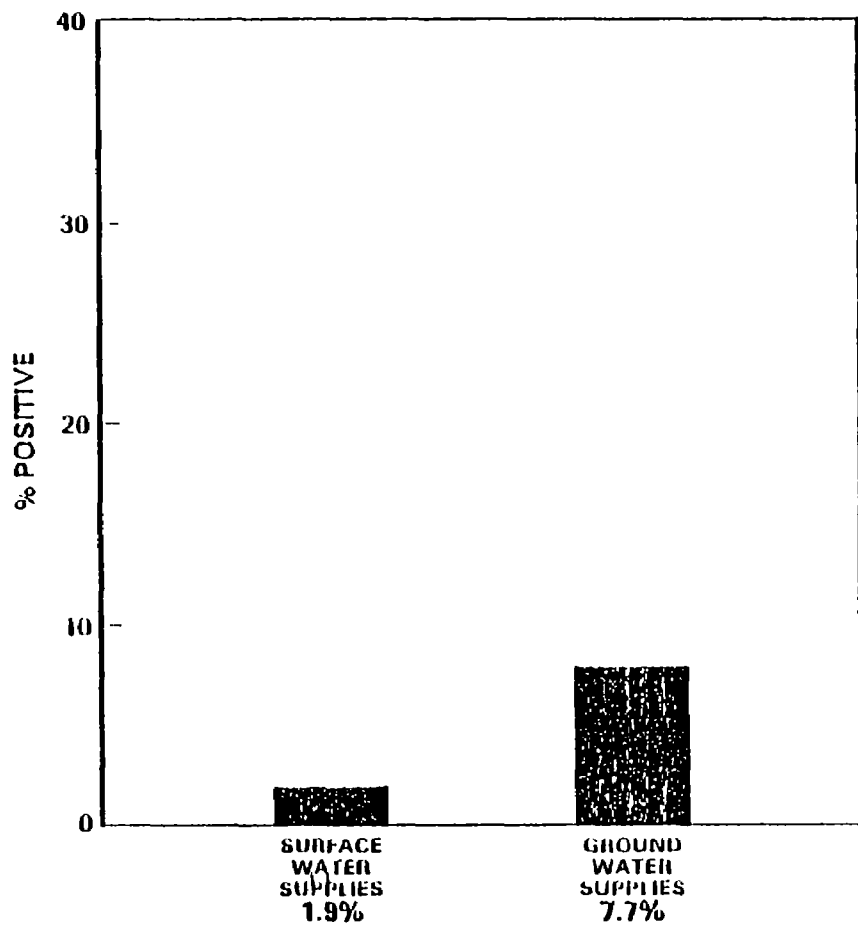
# TRANS — DICHLOROETHYLENE



# CIS - DICHLOROETHYLENE



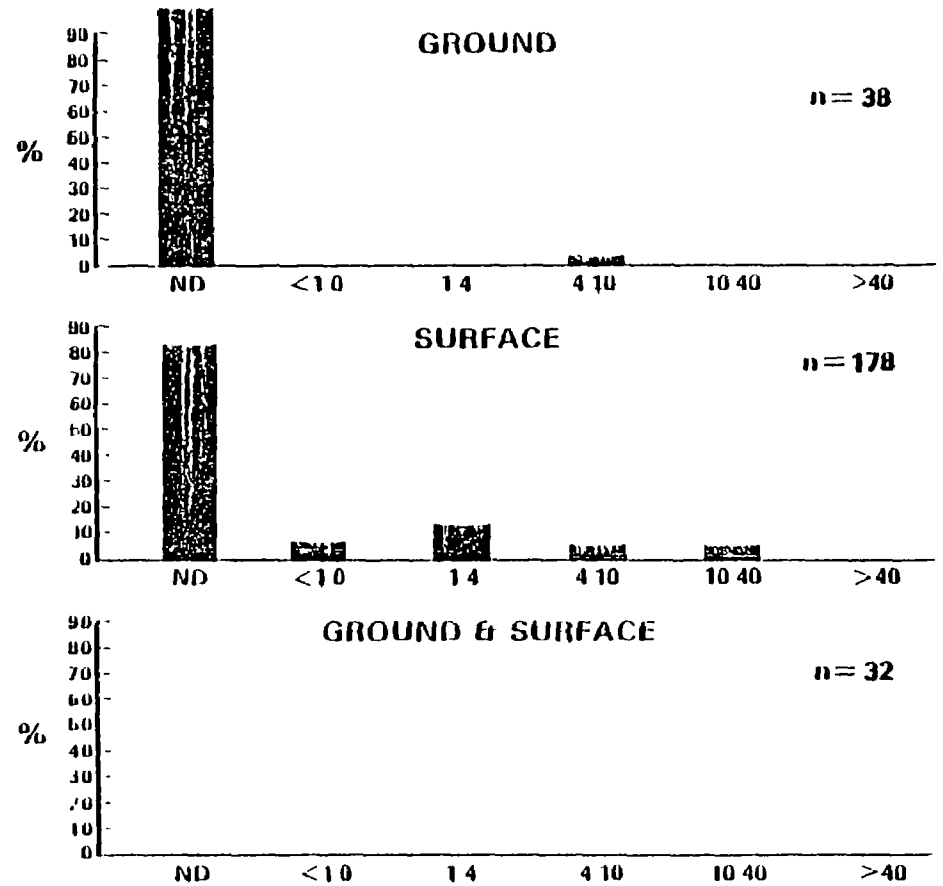
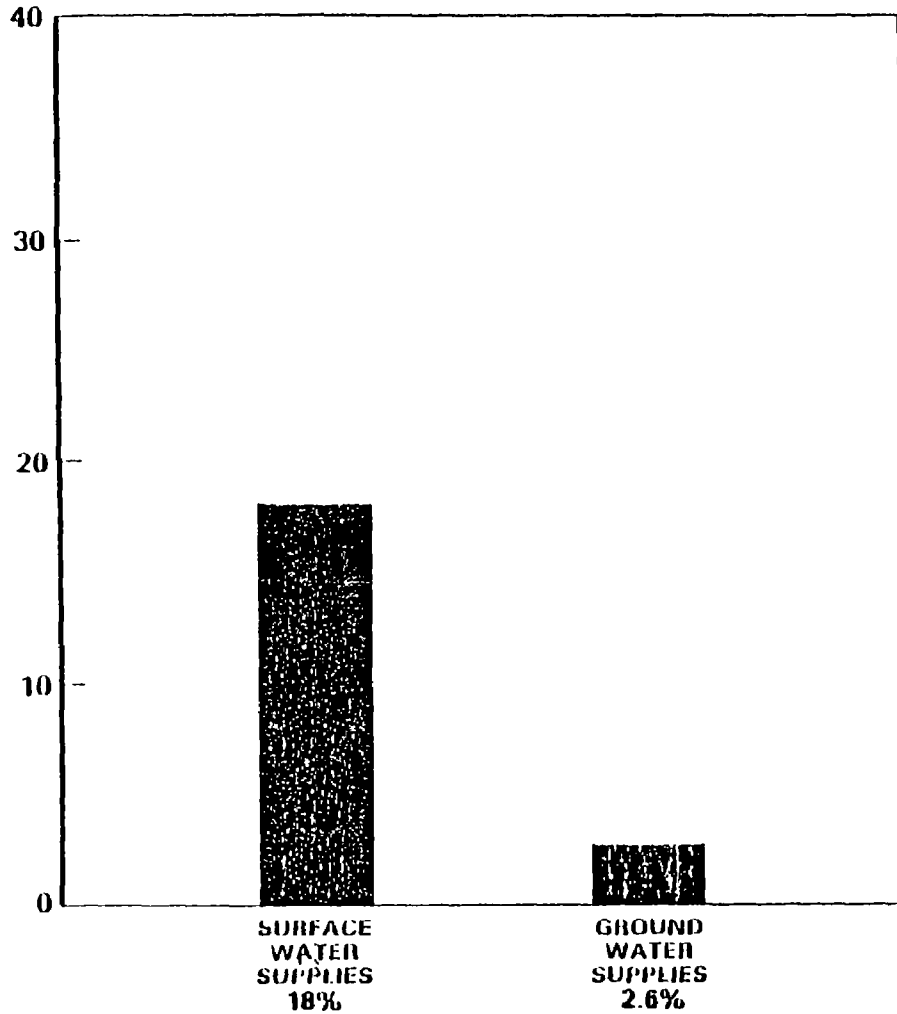
# 1,1 DICHLOROETHYLENE



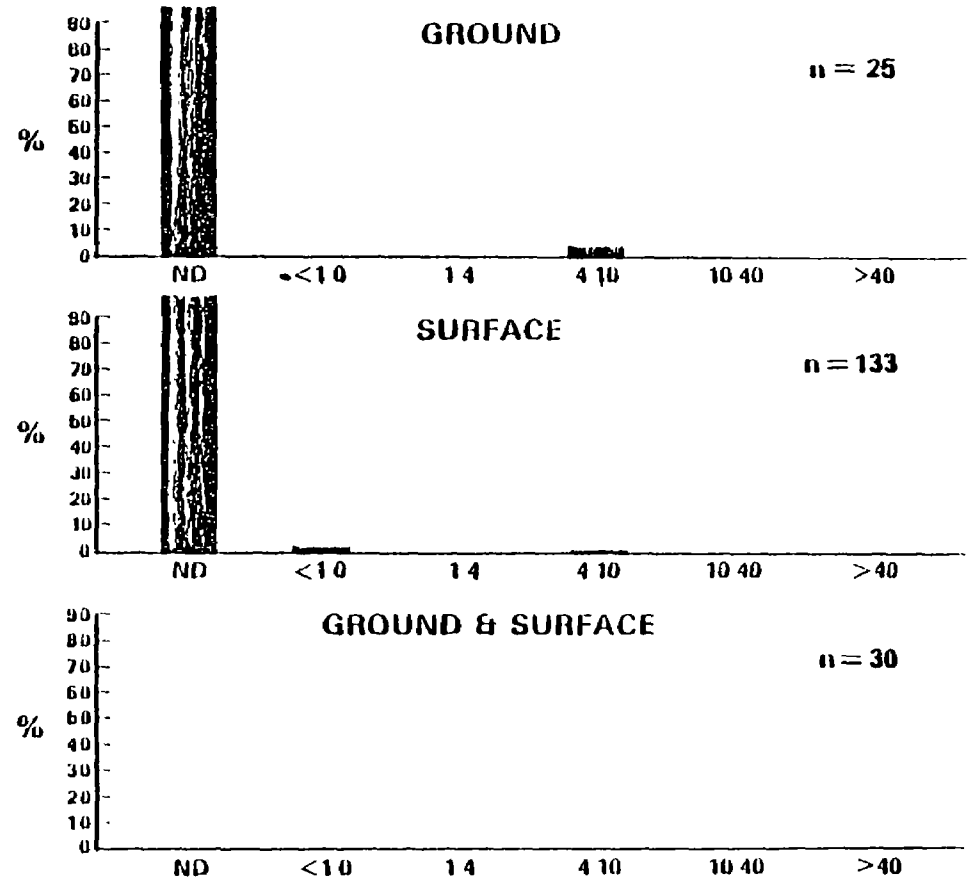
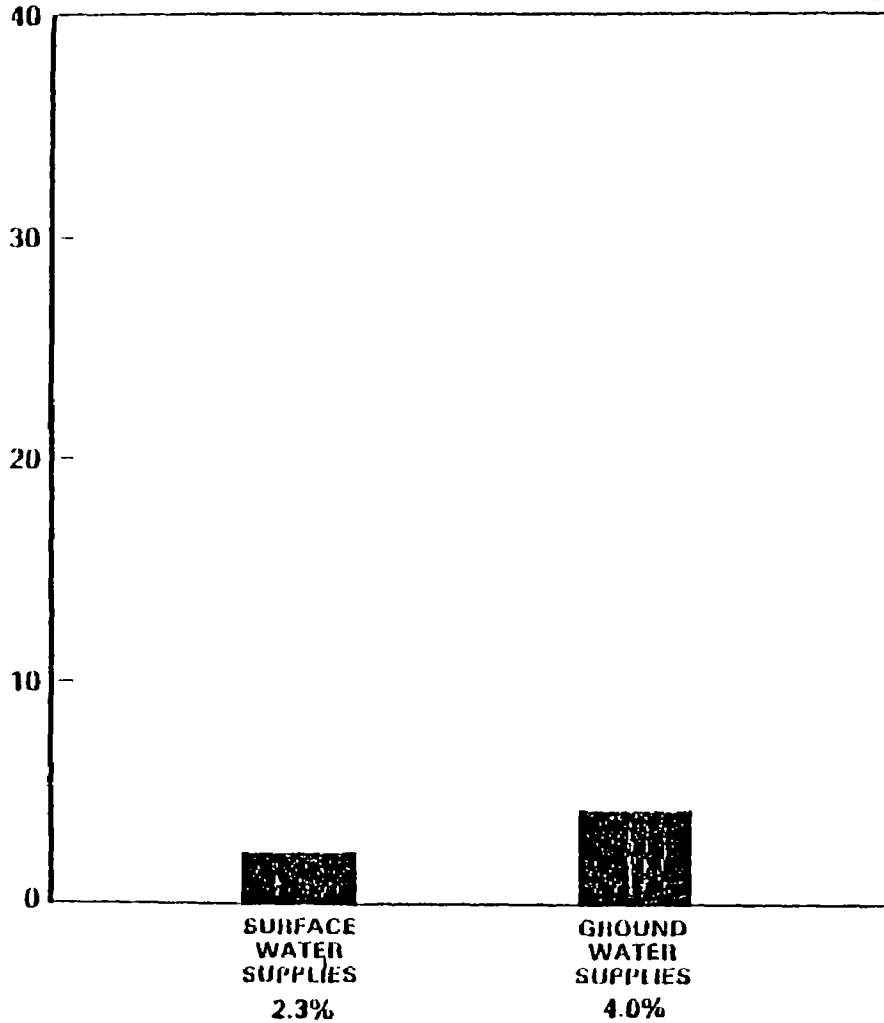
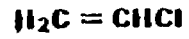


# METHYLENECHLORIDE

$CH_2Cl_2$



# VINYLCHLORIDE



GROUNDWATER DATA

AVAILABLE FROM STATE AGENCIES

HOT SPOTS

Intensive state investigation of localized ground water contamination problems.

Examples:

St. Louis Park, Minnesota  
wells closed as early as 1930's (phenols -PNA).

Jackson Township, New Jersey  
100 wells closed near dump (TCE - 1000 ug/l).

Denver, Colorado  
64 wells affected by pesticide disposal.

Number of Hot Spots known:

MA	44	IL	3	SC	1
CT	16	CA	3	CO	2
PA	25	MI	3	MD	1
NY	12	TN	3	DE	1
NJ	9	FL	2	IN	1
MN	4	NC	2	TX	1
NE	4	ME	2	MO	1
RI	4	WA	1	AL	1

SUMMARY OF STATE DATA

<u>CHEMICAL</u>	<u># STATES TESTED</u>	<u># WELLS* TESTED</u>	<u>% POSITIVE</u>	<u>MAX. UG/L</u>
TRICHLOROETHYLENE	8	2894	28	35,000
CARBON TETRACHLORIDE	4	1659	10	379
TETRACHLOROETHYLENE	5	1652	14	50
1,2-DICHLOROETHANE	2	1212	7	400
1,1,1-TRICHLOROETHANE	3	1611	23	2,250
1,1-DICHLOROETHANE	9	785	18	11,330
DICHLOROETHYLENES (3)	8	781	23	860
METHYLENECHLORIDE	10	1183	2	3,600
VINYL CHLORIDE	9	1033	7	380

\*RATIO OF COMMUNITY WELLS TO PRIVATE WELLS IS NOT KNOWN.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

TRICHLOROETHYLENE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
NEW JERSEY	411	27
ALABAMA	80	10
CONNECTICUT	1,200	2
DELAWARE	19	79
IDAHO	9	11
KENTUCKY	22	0
MAINE	89	0
MASSACHUSETTS	163	36
NEW HAMPSHIRE	6	17
N. CAROLINA	44	18
RHODE ISLAND	88	22
S. CAROLINA	4	0
S. DAKOTA	1	0
TENNESSEE	50	14
VIRGINIA	1	100
WASHINGTON	6	33
NEW YORK	372	13
FLORIDA	329	33
PENNSYLVANIA	?	?

\*20 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

CARBON TETRACHLORIDE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	0
CONNECTICUT	1,200	?
FLORIDA	329	50
KENTUCKY	22	5
MAINE	89	0
MASSACHUSETTS	163	0
NEW HAMPSHIRE	6	0
NEW JERSEY	411	23
NEW YORK	372	5
N. CAROLINA	44	0
PENNSYLVANIA	?	?
RHODE ISLAND	88	0
S. CAROLINA	4	0
S. DAKOTA	1	0
TENNESSEE	50	8

\*24 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

TETRACHLOROETHYLENE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	4
CONNECTICUT	1,200	?
FLORIDA	329	20
IDAHO	9	1
KENTUCKY	22	0
MAINE	89	0
MASSACHUSETTS	163	19
NEW HAMPSHIRE	6	0
NEW JERSEY	411	11
NEW YORK	372	15
N. CAROLINA	44	5
PENNSYLVANIA	40	48
RHODE ISLAND	88	?
S. CAROLINA	4	0
S. DAKOTA	1	0
TENNESSEE	50	2
WASHINGTON	32	34

\*22 STATES HAVE NOT TESTED FOR THIS CHEMICAL.



GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

1,2-DICHLOROETHANE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	3
DELAWARE	15	73
FLORIDA	329	15
KENTUCKY	22	0
MAINE	89	0
MASSACHUSETTS	163	3
NEW JERSEY	411	2
N. CAROLINA	44	7
PENNSYLVANIA	?	?
S. CAROLINA	4	25
S. DAKOTA	1	0
TENNESSEE	50	8
WASHINGTON	4	0

\*26 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

1,1,1-TRICHLOROETHANE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	10
CONNECTICUT	1,200	?
FLORIDA	329	15
IDAHO	9	11
KENTUCKY	22	0
MAINE	89	18
MASSACHUSETTS	163	21
NEW HAMPSHIRE	6	0
NEW JERSEY	411	48
NEW YORK	372	9
N- CAROLINA	44	2
PENNSYLVANIA	?	?
RHODE ISLAND	88	?
S- CAROLINA	4	0
TENNESSEE	50	26
WASHINGTON	32	69

\*24 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

1,1-DICHLOROETHANE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	8
FLORIDA	329	36
KENTUCKY	22	0
MAINE	89	0
MASSACHUSETTS	163	1
N. CAROLINA	44	14
PENNSYLVANIA	?	?
S. CAROLINA	4	0
TENNESSEE	50	26
WASHINGTON	4	0

\*29 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

DICHLOROETHYLENES

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	10
FLORIDA	329	38
KENTUCKY	22	0
MAINE	89	0
MASSACHUSETTS	163	8
NORTH CAROLINA	44	45
PENNSYLVANIA	?	?
S- CAROLINA	4	50
TENNESSEE	50	26

\*29 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES\*

METHYLENE CHLORIDE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	0
DELAWARE	9	56
FLORIDA	329	1
MAINE	89	0
MASSACHUSETTS	163	2
NEW JERSEY	411	0
N. CAROLINA	44	18
PENNSYLVANIA	?	?
S. CAROLINA	4	0
TENNESSEE	50	8
WASHINGTON	4	0

\*27 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

GROUND WATER DATA REPORTEDLY AVAILABLE  
FROM STATE AGENCIES \*

VINYL CHLORIDE

	<u># WELLS TESTED</u>	<u>% POSITIVE</u>
ALABAMA	80	1
FLORIDA	329	16
KENTUCKY	22	0
MAINE	89	0
NEW JERSEY	411	0
N. CAROLINA	44	34
PENNSYLVANIA	?	?
S. CAROLINA	4	0
TENNESSEE	50	6
WASHINGTON	4	0

\*29 STATES HAVE NOT TESTED FOR THIS CHEMICAL.

EXAMPLE OF INFORMATION  
AVAILABLE FROM SOME STATES

REPORTED FINDINGS IN NEW JERSEY GROUND  
WATER SURVEY - PARTIAL

# OF SAMPLES	CHEMICAL	% POSITIVE	FREQUENCY DISTRIBUTION (UG/L)			
			<1.0	1-10	10-100	>100
<u>TRIHALOMETHANES</u>						
399	CHLOROFORM	35	337	52	5	3
393	BROMOFORM	4	390	2	1	0
227	DIBROMOCHLOROMETHANE	8	226	1		
<u>VOLATILES</u>						
397	1,1,2-TRICHLOROETHYLENE	73	337	41	15	4
394	1,1,2,2-TETRACHLOROETHANE	6	393	1		
394	1,1,2-TRICHLOROETHANE	10	376	17	1	
394	CARBON TETRACHLORIDE	24	335	57	1	1
397	1,2-DIBROMOMETHANE	4	391	2	4	
391	1,2-DICHLOROMETHANE	2	387	4	1	
399	1,1,1-TRICHLOROETHANE	66	203	141	55	1
397	1,1,2,2-TETRACHLOROETHYLENE	23	348	34	15	
717	DICHLOROBENZENE	1	710	4	3	
396	TRICHLOROBENZENE	3	383	10	3	
397	IODOMETHANE	12	395	2		

THE FOLLOWING CHEMICALS WERE NOT FOUND: METHYL CHLORIDE, METHYL BROMIDE, VINYL CHLORIDE, METHOXYCHLOR, METHYLENE CHLORIDE, TRIFLUOROMETHANE, TOXAPHENE.



THE TEN MOST COMMONLY FOUND ORGANIC CHEMICALS  
 DETECTED IN NEW YORK PUBLIC WATER SYSTEM WELLS - 10/78

CONTAMINANTS	WELLS TESTED	WELLS POSITIVE	PERCENT POSITIVE	MAXIMUM LEVEL DETECTED (ug/L)
BIS(2-ETHYLHEXYL)PHTHALATE	39	36	92	170.0
TOLUENE	39	33	85	10.0
DI-N-BUTYL PHTHALATE	39	21	54	470.0
TRICHLOROETHYLENE	39	18	46	19.0
ETHYLBENZENE	39	17	44	40.0
DIETHYL PHTHALATE	39	13	33	4.6
TRICHLOROFLUOROMETHANE	39	11	28	13.0
ANTHRACENE/PHENANTHRENE	39	7	18	21.0
BENZENE	39	6	15	9.6
BUTYL BENZYL PHTHALATE	39	5	13	38.0

ORGANIC CHEMICALS DETECTED IN COMMUNITY WATER  
 SUPPLY WELLS NASSAU COUNTY, NEW YORK - 4/28/78

CONTAMINANT	WELLS TESTED	WELLS POSITIVE	PERCENT POSITIVE	MAXIMUM LEVEL DETECTED (UG/L)
TETRACHLOROETHYLENE	372	57	15	375
1,1,2-TRICHLOROETHYLENE	372	50	13	300
CHLOROFORM	372	41	11	67
1,1,1-TRICHLOROETHANE	372	33	9	310
CARBON TETRACHLORIDE	372	20	5	21
TRIFLUOROTRICHLOROETHANE	372	4	1	135

DATA BEING DEVELOPED

IN

1980

FUTURE SOURCES OF DATA ON  
ORGANICS IN GROUND WATER

FEDERAL PROGRAMS

ODW RURAL SURVEY	100 SAMPLES	FEB. 1980
	70 SAMPLES	MARCH 1980
	50 SAMPLES	APRIL 1980
	500 SAMPLES	JUNE 1980
	1,200 SAMPLES	FEB. 1981
ODW COMMUNITY SURVEY	100 SAMPLES	APRIL 1980
	230 SAMPLES	AUGUST 1980
OTS ALDICARB SURVEY	105 SAMPLES*	MAY 1980
OTS DBCP	50 SAMPLES	JULY 1980
OTS 5 CITY SURVEY		
ORD EXPOSURE ASSESSMENT	1,000 SAMPLES*	IN PLANNING

STATE PROGRAMS

DELAWARE	STATE-WIDE GROUND WATER PROGRAMS UNDERWAY
CONNECTICUT	
MASSACHUSETTS	
CALIFORNIA	

\*% GROUND WATER UNKNOWN-

COMPARISON OF SAMPLES AVAILABLE IN  
THE RURAL SURVEY AND USERS OF GROUNDWATER

<u>SIZE OF POP. SERVED</u>	<u>ESTIMATED NO. IN U.S.</u>	<u>NO. OF SAMPLES</u>
<u>PRIVATE WELLS</u>		
1-5 HOMES	10,000,000	1,298
<u>COMMUNITY SUPPLIES</u>		
25- 99	19,205	
100- 499	13,361	
500- 999	4,168	
1,000- 2,499	4,339	622
2,500- 4,999	1,619	
5,000- 9,999	1,355	
10,000- 99,000	1,196	
100,000-1 MILLION	66	
OVER 1 MILLION	1	

CHARACTERISTICS OF THE GROUND WATER  
 SAMPLES FROM THE RURAL SURVEY

<u>REGIONAL DISTRIBUTION</u>	<u>% U.S. POP. USING PUBLIC GW SUPPLIES</u>	<u>% SAMPLES RURAL SURVEY</u>
REGION I	3%	6%
REGION II	11%	7%
REGION III	4%	11%
REGION IV	16%	21%
REGION V	18%	22%
REGION VI	16%	11%
REGION VII	7%	9%
REGION VIII	5%	3%
REGION IX	17%	4%
REGION X	3%	4%
<u>SELECTED STATES (WORST CASE)</u>		
ALASKA	.05%	-
CALIFORNIA	13%	3%
FLORIDA	8%	3%
HAWAII	1.2%	-
TEXAS	10%	3%
PUERTO RICO	.6%	-
WYOMING	.2%	-

POPULATION CHARACTERISTICS OF SAMPLES FROM  
THE COMMUNITY WATER SUPPLY STUDY

<u>POPULATION</u> <u>SERVED</u>	<u># SAMPLES</u> <u>COLLECTED</u>	<u>ESTIMATED</u> <u># G.W.</u>
25- 99	55	38
100- 499	129	90
500- 999	64	44
1,000- 2,499	79	55
2,500- 4,999	39	27
5,000- 9,999	39	27
10,000-99,999	56	46

POPULATION CHARACTERISTICS OF GROUNDWATER  
SAMPLES PRESENT AND FUTURE

POPULATION SERVED	# SYSTEMS IN U.S.	# SYSTEMS FED. DATA	# SYSTEMS COMM. SURVEY*	% SYSTEMS TESTED	% SYSTEMS TESTED INCLUDING RURAL WATER SURVEY
25- 99	19,205	0	38	.2	} .9**
100- 499	13,361	0	90	.7	
500- 999	4,168	0	44	1.1	
1,000- 2,499	4,339	1	55	1.3	
2,500- 4,999	1,619	2	27	1.8	1.8
5,000- 9,999	1,355	1	27	2.1	2.1
10,00- 99,999	1,196	15	46	5.1	5.1
100,000-1 MILLION	66	20	0	30.3	.30.3
OVER 1 MILLION	1	0	0	0	0
TOTAL	45,310	39	327	.8%	2.2%

\*ESTIMATE

\*\*COMPLETE POPULATION BREAKDOWN AVAILABLE IN AUGUST.



1980 PLANS FOR EXAMINING VOLATILE  
ORGANICS IN DRINKING WATER WELLS\*

	<u>HOT SPOT INVESTIGATIONS</u>		<u>SYSTEMATIC SAMPLING</u>		<u>REMARKS</u>
	<u>PRIVATE</u>	<u>COMMUNITY</u>	<u>PRIVATE</u>	<u>COMMUNITY</u>	
CONNECTICUT	X	X		X	OVER 1200 SAMPLES. ALL COMMUNITIES TESTED BY APRIL 1980
MAINE	X	X		X	ALL COMMUNITIES TESTED IN 1978 (THMS&SELECTED VOLATILES)
MASSACHUSETTS	X	X		X	1,000 SAMPLES-NOV. 1980
NEW HAMPSHIRE	X	X		X	
CALIFORNIA	X	X		X	1-2000 SAMPLES-APRIL 1980
NEW JERSEY	X	X	?	?	LARGE AMOUNT OF DATA AVAILABLE FROM CANCER & TOXICS PROGRAM
PENNSYLVANIA	X	X		?	MAYBE
MARYLAND	X	X		X	LIMITED SAMPLING 2-75,000 POP. 16-8,500 POP.

\*TELEPHONE CONTACTS OF STATES REPORTEDLY HAVING ACTIVE PROGRAMS.

SUMMARY - DATA AVAILABILITY  
VOLATILES IN DRINKING WATER WELLS

	FEDERAL SURVEYS	STATE SURVEYS
MARCH 1980	209	1,000 - >3,000
NOVEMBER 1980	2,341	3,000 - >5,000
TOTAL	<u>2,550</u>	<u>4,000 - &gt;8,000</u>

## FINDINGS - ORGANICS IN GROUND WATER

- DATA ON THE OCCURRENCE OF ORGANICS OTHER THAN SELECTED VOLATILES IN GROUND WATER ARE NIL.
- FEDERAL SURVEYS:
  - NOMS, SRI, NORS, REGION V - LIMITED NUMBER OF SAMPLING SITES, WEIGHTED TOWARD LARGER COMMUNITIES.
  - RURAL SURVEY - WILL HELP TO CHARACTERIZE VERY SMALL COMMUNITIES; NO DATA FROM 3 STATES.
  - COMMUNITY SURVEY - WILL HELP TO CHARACTERIZE INTERMEDIATE SIZE COMMUNITIES.
- STATE SURVEYS:
  - SOME SAMPLING IN 19 STATES.
  - MOST OF THE DATA IS FROM CONNECTICUT, FLORIDA, MAINE, MASSACHUSETTS, NEW JERSEY AND RHODE ISLAND.
  - ADDITIONAL DATA MAY BE AVAILABLE IN TEXAS AND CALIFORNIA.
- THE FREQUENCY OF FINDING VOLATILE ORGANICS IS SIMILAR IN GROUND WATER AND SURFACE WATER.
- THE MAXIMUM CONCENTRATIONS FOUND IN GROUND WATER ARE HIGHER THAN THOSE FOUND IN SURFACE WATERS.
  - SEVERAL VOLATILE ORGANICS ARE FOUND MORE FREQUENTLY IN FINISHED SURFACE WATER THAN IN RAW WATER.

## RECOMMENDATIONS

### DATA GENERATION

INITIATE SAMPLING FOR OTHER  
HIGH PRIORITY ORGANICS IN  
GROUND WATER

COMPLETE THE ANALYSIS (VOA)  
OF COMMUNITY SAMPLES FROM THE  
RURAL SURVEY

EXPEDITE THE ANALYSIS OF GW  
SAMPLES FROM THE COMMUNITY  
SURVEY

INITIATE LIMITED SAMPLING FOR  
VOLATILES FROM SELECTED STATES AND  
INTERMEDIATE SIZE COMMUNITIES

### DATA ANALYSIS

COMPILE AND EVALUATE RAW DATA  
FROM STATE PROGRAMS

REFINE THE ANALYSIS TO  
DETERMINE THE EFFECT OF  
DIFFERENT TREATMENT REGIMES

### REGULATIONS

CONTINUE MCL DEVELOPMENT FOR:  
TRICHLOROETHYLENE  
CARBON TETRACHLORIDE  
TETRACHLOROETHYLENE  
1,1,1-TRICHLOROETHANE

CONTINUE A REVIEW TO DETERMINE  
IF NATIONAL MCL ARE NEEDED FOR  
OTHER VOLATILES